Water Resources Sustainability Project (WRS)

Annual Report 2001

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Introduction

This report presents the progress made by the WRS project in calendar year 2001 towards achieving the results of USAID's environmental strategic objective to "improve water resources management in the Souss-Massa". With the achievements of WRS in 2001, the project is on track to complete its ambitious agenda by the end of April 2001. The Drarga wastewater treatment plant operated throughout 2001 with the reuse component starting in May. In the Nakhla watershed, the objectives of soil erosion reduction targeted by the project have been exceeded. In Fes, the Dokkarat chromium recycling plant is complete. Problems with the piping network to transport chromium effluents have delayed the start of operations. However, the plant was tested extensively in 2001 and is achieving the projected performance in terms of chromium reduction. The issues concerning the piping network should be resolved by the end of the project in April 2002. In 2001, WRS also completed lessons learned workshops for the Drarga and Dokkarat projects, launched a project web site, and held a workshop on wastewater reuse. The Watershed Protection and Management (WPM) activity began on October 1st, 2001. Local staff and local expenses from WRS were transferred to the WPM activity, which is extending soil erosion control interventions in the Nakhla watershed and disseminating best practices developed under WRS in the Souss-Massa river basin. The move of WRS local staff and expenses to WPM has considerably reduced WRS local expenses in the fourth quarter of 2001.

Chapter 1 presents more details of the project's progress in 2001. Chapter 2 discusses the progress made towards reaching the project's indicators. Chapter 3 discusses difficulties encountered in 2001 and how they are being resolved. We have included pictures in the report to illustrate the project's activities. Budget expenditures and a list of reports are included as annexes.

1. Achievements

This section presents a summary of the WRS achievements in 2001.

1.1 Darga Wastewater Treatment and Reuse Pilot Project

The Drarga plant was inaugurated in October 2000 and functioned continuously throughout 2001. In the first quarter of 2001, the inter-institutional oversight committee for the Drarga project was created; the commune made arrangements to open a special account to start receiving revenues from the plant; and the piping system to irrigate the wastewater reuse perimeter near the plant was completed. Finally, an Association of users of the treated wastewater was formally created in January.

In the second quarter, the Drarga wastewater treatment plant continued to operate and we began the reuse of treated effluents with impressive results. On May 8th, Maureen Quinn, U.S. Chargé d'Affaires inaugurated the reuse component of the Drarga pilot project. After the inauguration, treated effluents began to be sold to farmers.

In the third quarter, we installed a new billing system for water and sewage at the Drarga plant and a software package that will enable the Commune of Drarga to track expenses and revenues of the wastewater treatment plant. In addition, computer equipment for tracking the technical and financial performance of the plant was installed at the Commune of Drarga and at the plant site. In July, Mario Kerby (COP) presented the Draga wastewater treatment and reuse project at the Millennium Plus One Workshop of USAID environmental officers that took place in Cumberland, Maryland.

In the fourth quarter, we installed a synthetic cover on one of the anaerobic basins for the methane recovery system. However, the first cover installation did not work and will be redone in the first quarter of 2002. In December, the commune of Drarga received agreement from the Ministry of Finance to set up a special account with an independent budget for the Drarga plant.

1.2 Dokkarat Chromium Recycling Project

On February 22nd, WRS and its project partners in Fes held a meeting to complete the transfer of the facility from the contractor to the RADEEF. At that meeting, we decided to accept all of the civil works as completed, but the committee felt there were still minor adjustments to be made inside the plant by the contractor before a full transfer can occur. A campaign of testing the integrity of the sewage network in January revealed that several leaks were still present. We also completed a program to assist the RADEEF in managing the plant, and we trained RADEEF and MOE staff in the use of this program.

In the second quarter of 2001, the Dokkarat chromium recovery plant started operations and began producing recycled chromium. Activities in the second quarter focused on ensuring the proper functioning of all equipment and the integrity of the system. In May, we started receiving chromium from the tanneries of Dokkarat and we conducted several precipitations to produce recycled chromium. We purchased and stored chemical products on site (sulfuric acid, polymer, and caustic soda). On May 21st, the plant was visited by a technical committee of the Arab league, and on May 22nd, the plant was visited by a delegation of Arab Ministers of Environment. These visits provided a great deal of visibility to the Dokkarat pilot project and generated interest in replication of this technology.

During the testing phase of the Dokkarat chromium recovery plant in May and June 2001, we identified a number of problems that need to be resolved to ensure that the plant is fully operational with the preservation of the safety of RADEEF operators. We identified four issues that had to be addressed prior to the operation of the plant: (1) the fiberglass lining inside the sulfuric acid tank has to be removed; (2) the pumps to transfer incoming chromium effluents to the storage tanks have to be reinstalled and checked for air intrusion; (3) new vibration joints for the sulfuric acid pumps have to be installed; and (4) sections of the piping network to transport chromium effluents that are leaking have to be redone. In the third and fourth quarters, we addressed all these problems.

We also continued to train the RADEEF operators on the operations of the plant and on safety precautions to be taken. In July, Dave Bennett (plant designer) and Xavier Guillas (engineer) were fielded in Fes to continue training RADEEF staff on plant operations and to finalize the operations manual for the Dokkarat chromium recycling plant.

In the third quarter, further testing of the piping network revealed the continuing presence of leaks. A visual inspection by camera identified a particularly troublesome segment. In the fourth quarter, we engaged the services of ENADEP to repair the leaking segment by encasing the pipes in a concrete bed. This work was completed in December. The issue of the integrity of the Dokkarat piping network is addressed more fully in the section on problems encountered during the year.

1.3 Nakhla soil erosion control project

In the first quarter of 2001, we planted an additional 35,000 olive trees on 275 hectares in the Zones II and III of the Nakhla watershed. In addition, the project distributed 10,500 fruit trees (apple, prune, pear, and quince) that were planted on 30 hectares on irrigated terraces near the Douars of Bettara, Ouadyine, Bouattou, Azzemour, and Achekrade. In January, we proceeded to biologically stabilize ravines in Zone 1 with the plantation of acacia trees provided by the Ministère des Eaux et Forêts. In February, we installed grass strips along contour lines in Zone 2.

The project, along with the DPA of Tetouan, conducted several training activities for farmers of the Nakhla watershed in the first quarter of 2001. Specifically, we conducted training on tree planting techniques and on the making of catch basins. We also worked with the Cooperative of women from Zone 1 on the introduction of improved cookstoves in the watershed and the mechanisms for managing a communal cookstove.

In February, we installed devices to measure the quantity of sediments trapped by catch basins in the Nakhla watershed. These devices will be used to refine measurements of the impact of project activities on soil loss.

In the first quarter of 2001, Mohamed Khattouri from Chemonics enhanced the GIS application he had started in 2000 for the Nakhla watershed by incorporating the modeling of the impact of project interventions on the sedimentation of the Nakhla dam in the long run. The GIS tool was presented to Maureen Quinn, U.S. Chargé d'Affaires on May 8th and to USAID on June 8th.

In the second quarter of 2001, WRS and its implementation partner, the DPA of Tetouan conducted numerous training and public awareness activities in the Nakhla watershed. The tree planting campaign continued with the distribution of 3,000 olive trees in the second quarter of 2001 and of 13,000 fruit trees in irrigated terraces. Fifteen hectares of grass strips were installed in Zone II, with 48 farmers benefiting from this operation.

In the second quarter, 0.8 kilometers of ravines were stabilized biologically with acacia. An additional 13 water points were identified in Zones I and II. We also continued the implementation and monitoring of indirect activities. Specifically, we worked with our DPA partners to monitor the progress of the male goats that were introduced in the watershed last year and conducted a vaccination campaign for 1,100 goats. For the apiculture activities, we treated the bees introduced in Zone IV against parasites and supplemented the feeding of the bees with sugar to counteract the effects of the drought.

In the third quarter of 2001, WRS distributed 25 goats in the Nakhla watershed and the DPA undertook a new campaign of vaccinations. This brings to 50 the number of goats distributed. We also continued the program of training for women in the use of improved cookstoves. One demonstration cookstove was distributed and is now being

used. The cookstove demonstration was very successful and additional cookstoves will be provided in the fourth quarter.

WRS and the DPA of Tetouan continued a series of training programs for farmers on improved farming techniques and the maintenance of trees and catch basins. Finally, we did an assessment of the beekeeping program in the douar of Zerka. We are considering strengthening the Association of beekeepers with additional training due to their poor maintenance of the beehives. The production of honey during this campaign was disappointing due to the impact of the drought and to the lack of maintenance by the beekeepers association.

In the fourth quarter, WRS consultant David Mulla prepared an assessment of the overall impact of WRS activities in the Nakhla watershed. The WPM activity began in October to extend soil erosion control activities begun under WRS to the entire watershed. The Agence du Nord and the new Wali of Tetouan are keen to continue and expand on the institutional partnership started in Nakhla. As WPM gets underway, further activities in the Nakhla watershed will cease to be reported under WRS

1.4 Water Policy and Institutional Development

In the first quarter of 2001, we began the implementation of cost recovery mechanisms for the Drarga wastewater treatment plant through the organization of the Association of water users for the treated effluent of the plant. This association will purchase the treated effluents and contribute to the operation and maintenance expenses of the plant.

The visibility of the Environment Department was enhanced by the presentation of the Drarga project to a group of journalists from the Agadir area in February. The project produced posters for the Dokkarat and Nakhla projects and pamphlets for the Dokkarat project. These tools have been widely used by MOEs Communications Department at various public events.

In the Nakhla watershed, we conducted several public awareness activities in the second quarter of 2001. The CT of Ben Karrich conducted demonstration on fertilizer application and parasite treatment on 2.7 hectares of cereal, 2 hectares of forage crops, and 1.5 hectares of legumes. In June, the CT conducted training sessions for farmers on the implementation of catch basins (cuvettes) around olive trees. A total of 74 farmers were trained. In addition, two public awareness sessions on the use of improved cookstoves were held for the women of the douar of Bouattou in Zone I. The training focused on the maintenance of the cookstoves and on bread baking techniques.

In May, we held a workshop in Agadir on the reuse of treated wastewater in Agriculture. This workshop was attended by representatives of: the Department of Environment, DRH, ORMVA, ONEP, RAMSA, Ministry of Health, the Commune of Drarga, ERAC,

the Agadir University Department of Science, and IAV. The workshop dealt with institutional, technical, environmental, and health aspects of wastewater reuse.

In May, we held two lessons-learned workshops for the Drarga and Dokkarat pilot projects. The participants to these workshops included representatives from all the institutions that participated in the project since its inception, including consultants and subcontractors. In the workshops, participants discussed the successes and difficulties of each project, and identified steps to be replicated and steps to be modified or improved. The results of these workshops will form the basis for the project's lessons learned reports.

On June 6th, Mario Kerby (COP) presented the WRS project at an environmental conference in Casablanca on the occasion of World Environment day. The conference was attended by Moroccan environmental specialists and focused on the key environmental challenges facing Morocco with a special emphasis on water.

WRS had a booth at the first annual international fair on environmental technologies and equipment held in Casablanca from June 13th to 16th. We presented posters on all three WRS pilot projects.

In November, Mr. Kerby participated in a panel discussion at the COP7 conference in Marrakech on water and global climate change. The panel made recommendations that were adopted at the conference to highlight the linkages between water scarcity and global climate change.

In the fourth quarter of 2001, a project web site was designed and implemented. The web site describes project activities and achievements and is linked to the USAID, MOE, Chemonics, and ECODIT web sites. The web site address is: www.proprem.com

2. Impact of Project Activities

This section presents the impact of WRS activities in 2001 on indicators of performance.

2.1 Drarga wastewater treatment and reuse pilot project

The plant's performance has exceeded the targets and meets all criteria for pollution abatement. Table 1 shows the reduction in key pollution parameters from the Drarga plant.

Table 1
Pollution Abatement Performance of the Drarga Plant

Indicator	BOD_5 (mg/l)	COD (mg/l)	TSS (mg/l)	NTK (mg/l)	Fecal Coliforms (# / 100ml)
Entrance	625	1825	651	317	1.6×10^7
Target	<30	N/A	<30	<20	<1000
Exit	9	75	3.9	10	500
% Reduction	98.6	95.9	99.8	96.8	99.9

BOD_5 = Biological oxygen demand
COD = Chemical oxygen demand
TSS = Total suspended solids
NTK = Total nitrogen

In addition to the plant's physical performance, water savings were achieved in 2001 through the reuse of wastewater. We estimate that approximately 70,000 m^3 of treated wastewater from the Drarga plant were reused to grow crops and irrigate green spaces in 2001.

2.2 Dokkarat chromium recycling project

In Dokkarat, the chromium recycling plant functioned on and off throughout 2001. The plant was operational in May and June. Adjustments to the plant were made in July through September and the plant resumed operations in October when further leaks were detected in the piping network to transport chromium effluents from the tanneries to the plant. During the testing phase, the plant did meet its goals of recovering over 99% of the chromium that was coming in. However, due to the problems encountered in the year, the recycling of chromium within the tanneries could not be undertaken.

2.3 Nakhla soil erosion control project

Dr. David Mulla, expert in soil loss measurements, was fielded in November 2001 to assess the impact of activities in the Nakhla watershed on key indicators. Table 2 summarizes the achievements of the WRS project in the Nakhla watershed.

Table 2: Indicators of Project Success

Indicator	Target	Actual Quantity
Sign Workplan Agreement with Project Partners	4	4
Olive Tree Plantings	38,700	113,885
Cuvette Construction	387 ha	762 ha
Hire Guards for Trees	0	4
Plant fruit trees for terraces	5,000	12,800
Grass Strips Between Trees	183 ha	156 ha
Develop Spring Water	0	5
Number of farmers and families trained in conservation techniques	190	1240+
Number of women's associations formed	4	1
Distribute cookstoves	4	1
Stabilization of ravines	3.1 km	3.5 km
Distribute Spanish Goats	25	50
Reseeding Rangeland	92 ha	11 ha
Beekeeping Operations	100	100
Rehabilitate Mattoral	24,000 trees	none
Rotational Grazing	92 ha	0 ha
Reduction in Erosion (olives)	12,700 t/yr	144,780 t/yr
Reduction in Erosion (olives)	25%	92%
Reduction in Erosion (watershed)	- - -	21%
Reduction in Siltation	2.5%/yr	14%/yr

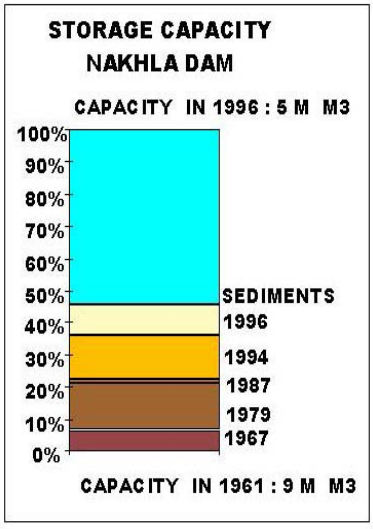
The table shows that the project exceeded its goals with respect to the reduction in erosion in the target areas and of siltation of the Nakhla dam.

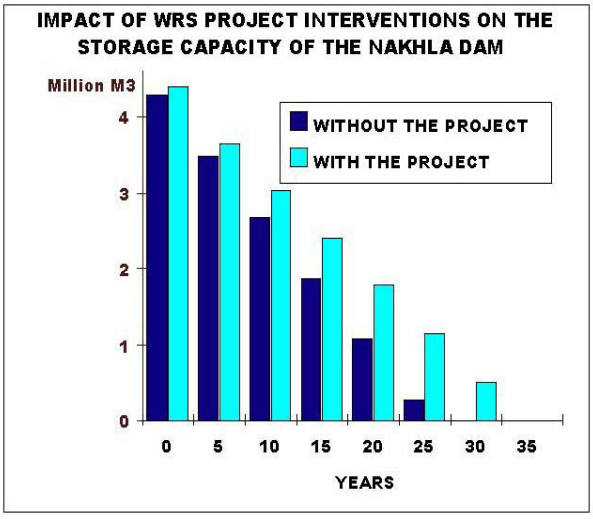
Most of the impact on soil loss came from the plantation of olive trees. In the long run, when the trees will mature, they will engender a significant reduction in soil loss, as is illustrated in Table 3 below.

Table 3: Impacts of Olive Tree Plantings (762 ha) on Erosion and Sedimentation

	Erosion Rate (t/ha/yr)	Erosion Rate (t/yr)	Sedimentation in Reservoir (t/yr)	Loss of Reservoir Storage Capacity (MCM/yr)
Before Project	207	157,734	23,660	0.160
With Immature Olive Trees	156	118,872	17,831	0.154
With Mature Olive Trees	17	12,954	1,943	0.138
Reduction	190	144,780	21,717	0.022
Reduction (%)	92	92	14	14

The average rate of erosion estimated without project interventions was 64 tons/ha/yr. After project interventions, erosion from the watershed will be reduced to 51 t/ha/yr. This is a projected 21% reduction in erosion rates for the entire watershed due to project interventions after olive trees have reached maturity (after 5 years). Without project intervention, the Nakhla reservoir is expected to be completely filled in 25 years. The pilot project interventions in targeted zones will extend the useful lifetime of the reservoir by another 8 years.





3. Difficulties encountered in 2001

While WRS had significant achievements in 2001, we also encountered a number of difficulties during the year. The major difficulties were related to the Dokkarat chromium recycling pilot project. During the testing phase of the plant in May 2001, a number of technical problems were encountered at the plant including: the lining in the sulfuric acid tanks came unglued, two vibration joints for diluted acid pumps burned, and the chromium effluent pumps had air intrusion. All of these issues were resolved by the end of the year, and the plant is now in proper working order. However, during testing of the piping network, we discovered intrusion of the water table into the network that significantly dilutes the chromium arriving at the plant. We attempted to resolve this problem by identifying the segment of the piping network most susceptible to aquifer intrusion and by encasing the pipes in that segment in a concrete bed. Following these repairs in November and December, we discovered that a key manhole was still leaking. With the RADEEF and the Wilaya of Fes, we are in the process of finding a definitive solution to ensure the integrity of the chromium recycling system. The company that built the piping network will fix all identified leaks, at their own expense, prior to the end of WRS in April 2002. In addition, a system that would allow the storage of chromium effluents outside each tannery and their transport by truck to the plant will ensure the long-term sustainability of the project. The implementation of this solution, however, is beyond the budget and timing of WRS.

In the Dokkarat project, a contractual issue emerged between ECODIT and El Mokha, the company that built the chromium recovery plant. El Mokha demanded additional payment for services that ECODIT claimed had already been paid. Further, as per the contractual clauses, ECODIT demanded penalties for delays in construction by El Mokha, which El Mokha refused to pay. By the end of 2001, this dispute was on the way to being resolved amicably.

In Drarga, the commune failed to establish a special account during 2001, due to delays in receiving the approval from the Ministry of Finance. This meant that the commune did not receive revenues from the sale of treated wastewater. The special account authorization was finally given in December 2001. We expect the commune to begin collecting fees for the sale of treated wastewater and to increase the sewage charge. Once the cost recovery mechanisms are fully in place, the plant's sustainability will be ensured.

In Drarga, we also had a problem with the installation of the synthetic liner over one of the anaerobic basins. The liner became detached at the corners of the basin. The liner will be reinstalled using a new system that will ensure that all of the methane gas produced by the anaerobic basins is captured for conversion to energy.

There were no particular difficulties encountered in 2001 in the implementation of the Nakhla soil erosion project.

4. Field Missions in 2001

Below is a list consultants fielded by WRS in 2001.

- ***Xavier Guillas (ECODIT)*** was fielded in February to test the Dokkarat chromium recovery plant and train RADEEF staff.

- ***Khalid Khallayoune (Chemonics)*** was fielded in March to conduct parasitic tests in Drarga.

- ***Fouad Rachidi (University of Georgia)*** was fielded in March to assist with the implementation of WRS activities in the Nakhla watershed.

- ***Mohamed Khatouri (Chemonics)*** was fielded in April to finalize the GIS tool for the Nakhla watershed.

- ***Mohamed Mounsif (University of Georgia)*** was fielded in April to assist with the implementation of the goat distribution in the Nakhla watershed.

- ***Jalil El Fadli (Chemonics)*** was fielded in April and May to prepare press articles on WRS activities.

- ***Rachid Bouabid (Chemonics)*** was fielded in April and May to assist WRS with the implementation of WRS activities in the Nakhla watershed.

- ***Joseph Karam (ECODIT)*** was fielded in May to assist with the lessons-learned workshop for the Dokkarat chromium recovery project and with the visit of Arab Ministers of Environment to the Dokkarat plant.

- ***Jean Tilly (ECODIT)*** was fielded in May to participate in the Dokkarat lessons-learned workshop and to assist with the operations of the Dokkarat chromium recovery plant.

- ***Mohamed Kastou (ECODIT)*** was fielded in May and June to assist with the testing phase of the Dokkarat chromium recovery plant.

- ***Driss Messaho (ECODIT)*** was fielded in May and June to assist the tanners of Dokkarat during the start-up of the chromium recovery plant.

- ***Xavier Guillas (ECODIT)*** was fielded in June to continue the training of RADEEF and MOE staff on operations of the Dokkarat chromium recovery plant.

- ***Xavier Guillas (ECODIT)*** was fielded in July to continue training RADEEF staff in Dokkarat chromium recovery plant operations.

- ***Joseph Karam (ECODIT)*** was fielded in August to help establish a special account at the Commune of Drarga and work on the cost recovery mechanisms for the Drarga wastewater treatment plant.

- ***Mohamed Khatouri (Chemonics)*** was fielded in August as Interim Chief of Party while Mario Kerby was on vacation.

- ***Brahim Soudi (Chemonics)*** was fielded in August and September to assist with a study on wastewater reuse options for the wastewater treatment plant of the Greater Agadir area.

- ***Mohamed Kastou (ECODIT)*** was fielded in September to assist in the supervision of repairs at the Dokkarat chromium recovery plant.

- ***Ousmane N'Diaye (Chemonics)*** was fielded in November to install a new accounting software for the WRS office.

- ***Mohammed Khatouri (Chemonics)*** was fielded in November to complete the WRS web site.

- ***David Mulla (Chemonics)*** was fielded in November to assess the impact of WRS soil erosion control activities in Nakhla.

- ***Jean Tilly (ECODIT)*** was fielded in November and December to assist with the preparation of manuals and guidelines for the Dokkarat and Drarga projects.

5. Meetings Attended

Table 4 below summarizes key meetings and workshops organized or attended by WRS staff in 2001.

Table 4

Key Meetings Attended in 2001

Meeting Description	Participants	Date
Distribution of olive trees in Zone III of the Nakhla watershed	WRS, MOE, DPA	January 4-5
Meeting with MOE's oversight committee	WRS, MOE	January 15
Site visit to Dokkarat by the Regional Legal Advisor	WRS, USAID	January 19
Creation of water users association in Drarga for wastewater reuse	WRS, Commune of Drarga, Drarga farmers	January 24 - 25
Meeting with MOE's oversight committee to prepare dissemination workshop	WRS, MOE	January 26
Workshop in Fes on "clean tanning" trials	WRS, RADEEF, AFD	January 29
Plantation of fruit trees in Nakhla	WRS, DPA	February 5 - 9
Creation of the Drarga technical oversight committee	WRS, Wilaya of Agadir, Commune of Drarga, ONEP, DRH, RAMSA, ORMVASM, MOE, Ministry of Health, IAV, University of Agadir, ERAC	February 7
Meeting with USAID on SO2 closeout	WRS, USAID	February 8
Site visit to Drarga on gender issues	WRS, USAID	February 14
Meeting with DPA of Tetouan on the Contract Program for 2001	WRS, MOE, DPA	February 19
Meeting of the Dokkarat oversight committee	WRS, MOE, Wilaya of Fes, Commune Agdal, RADEEF	February 22
Site visit for journalists of the Drarga plant	WRS, MOE, Journalists of the Agadir area	February 27
Meeting of the Fes oversight Committee	WRS, MOE, RADEEF, Wilaya of Fes	March 16
Meeting with MOE's oversight committee	WRS, MOE	March 16
Conference on the "Social Management of Water"	WRS, UNESCO	March 22-23

Table 4

Key Meetings Attended in 2001

Meeting Description	Participants	Date
Meeting of the inter-institutional Drarga technical oversight committee	WRS, Wilaya of Agadir, Commune of Drarga, DRH, ONEP, RAMSA, ORMVASM, IAV Hassan II, MOE, Ministry of Health, ERAC-Sud	April 13
Meeting with USAID	WRS, USAID	April 23
Meeting with DPA on Nakhla activities	WRS, DPA	April 24
Peace Corps workshop for returning PVCs	WRS, Peace Corps	May 3
Inauguration of Drarga wastewater reuse	WRS, US Embassy, Wilaya of Agadir, Commune of Drarga, USAID	May 8
Workshop on wastewater reuse in agriculture	WRS, Wilaya of Agadir, Commune of Drarga, DRH, ONEP, RAMSA, ORMVASM, IAV Hassan II, MOE, Ministry of Health, ERAC-Sud, Province of El Jadida, Province of Ouarzazate	May 8
Presentation of Nakhla GIS	WRS, US Embassy, USAID	May 8
Meeting at the Fes Wilaya to prepare the visit of Arab Ministers of Environment	WRS, MOE, Wilaya of Fes, RADEEF, Commune Agdal Fes	May 14
Visit of the Dokkarat plant by members of the Arab league technical committee on clean technologies	WRS, MOE, Arab League	May 22
Visit of the Dokkarat plant by Arab Ministers of Environment	WRS, MOE, Wilaya of Fes, Commune Agdal Fes, RADEEF, Arab Ministers of Environment	May 23
Workshop on lessons learned from the Dokkarat chromium recycling project	WRS, MOE, RADEEF, Wilaya of Fes, DRH, ONEP, Ministry of Commerce and Industry, CID	May 24
Conference on World Environment Day in Casablanca - presentation of WRS	WRS, MOE	June 6
Nakhla GIS presentation for USAID	WRS, USAID	June 8

Table 4

Key Meetings Attended in 2001

Meeting Description	Participants	Date
Meeting on wastewater reuse options in Agadir	WRS, Wilaya of Agadir, SIWM, DRH, ONEP, RAMSA, ORMVASM	June 12
International Fair on Environmental Technologies in Casablanca	WRS, MOE	June 13 - 16
Meeting on wastewater reuse options in Agadir	WRS, Wilaya of Agadir, SIWM, DRH, ONEP, RAMSA, ORMVASM	June 18
Meeting with MOE oversight committee	WRS, MOE	June 25
Briefing on the Conseil Supérieur de l'Eau	WRS, SIWM, USAID	June 29
Delivery of goats in Nakhla	WRS, MOE, DPA, Agence du Nord	July 17
Presentation on the Drarga project at the Millennium Plus One Workshop in Cumberland, Maryland	WRS, USAID	July 19
Meeting with Agence du Nord on Nakhla activities	WRS, Agence du Nord	July 24
RADEEF training in Fes	WRS, MOE, RADEEF	July 26 - Aug 1
Meeting on wastewater reuse for the Greater Agadir	WRS, Wilaya of Agadir, DRH, RAMSA, ONEP, ORMVA/SM	August 20
Meeting with the RADEEF	WRS, RADEEF	September 5
U.S. Ambassador lunch on water management in Morocco	U.S. Embassy, WRS, USAID, MOE, M. of Agriculture, DRH, ONEP, ALMAE	September 19
Meeting with the Wali of Fes	WRS, USAID, Wali of Fes	September 24
Workshop on soil erosion	WRS, MOE	September 25
Meeting of the Committee on wastewater reuse options for the greater Agadir area	WRS, Wilaya of Agadir, SIWM, RAMSA, DRH, ONEP	October 1
Meeting with project partners in Nakhla	WRS, MOE, DPA	October 8
Meeting on Dokkarat issues	WRS, RADEEF, Wilaya of Fes	October 23
Meeting on international wastewater reuse conference	WRS, USAID, IDRC	October 24
Meeting with the DPA of Tetouan	WRS, DPA, MOE	October 25

Table 4

Key Meetings Attended in 2001

Meeting Description	Participants	Date
Water forum at the COP7 in Marrakech	WRS, MOE	November 5
Meeting with Agence du Nord on Nakhla extension	WRS, USAID, Agence du Nord	November 14
Meeting with Agence du Nord on Nakhla partnership	WRS, Agence du Nord	November 19
Meeting with USAID	WRS, USAID	December 5
Trip to Nakhla	WRS, USAID, Agence du Nord, DPA, MOE	December 19 - 20

6. Deliverables

Table 5 summarizes the deliverables submitted in 2001.

Table 5

Deliverables Submitted in 2001

Deliverable Title	Date
2001-2002 Work Plan – Draft version	January 2001
Lessons Learned Report on Drarga Pilot Project **Joseph Karam**	January 2001
Annual Report January 1 – December 31, 2000	March 2001
Lessons Learned Report on Nakhla Pilot Project Draft Version **Fouad Rachidi**	March 2001
Application du Système d'Information Géographique pour l'Evaluation de l'Impact du Projet sur la Réduction de l'Erosion Draft Version **Mohamed Khatouri**	April 2001
2001 – 2002 Work Plan – Last Version	May 2001
First Quarter 2001 Progress Report	May 2001
Mise en Oeuvre du Périmètre irrigué avec les Eaux Usées dans la Commune de Drarga **Brahim Soudi**	July 2001
Evaluation des Performances Epuratoires de la station de Traitement des Eaux Usées de Drarga **Khalid Khallaayoune**	July 2001
Elaboration du plan d'action pour la réutilisation des eaux usées épurées et de valorisation des sous produits dans le Grand Agadir Draft Version **Brahim Soudi**	September 2001
Second Quarter 2001 Progress Report	September 2001
Third Quarter 2001 Progress Report	November 2001
Elaboration du plan d'action pour la réutilisation des eaux usées épurées et de valorisation des sous produits dans le Grand Agadir **Brahim Soudi**	December 2001
Etat d'avancement de la mission d'expertise pour l'évaluation des performances épuratoires de la station de traitement des eaux usées de Drarga – Final Version **Khalid Khallaayoune**	December 2001
Pilot Project for Control of Soil Erosion in the Oued Nakhla Watershed Final Progress Report **David Mulla**	December 2001
WRS Project Website **Mohamed Khatouri**	December 2001